Anaerobic Digestate could be a Replacement for Peat in Potting Mix

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About Peat

Peat or peat moss is the accumulation of partially decayed plant matter typically found in swamps or bogs where acidic and anaerobic conditions occur. The plant matter that makes up peat is mostly mosses but can also include sedges and shrubs. While the rate of deposition is faster than decomposition, it takes thousands of years for peat to accumulate to 1.5-2.3 meters (45-7.5 ft.), making peat an unsustainably mined commodity even with successful restoration efforts.

About Anaerobic Digestate

Anaerobic digestion (AD) is an effective approach to mitigating green house gas (GHG) emissions, odors, and pathogens emanating from dairy farms, while allowing farmers to offset purchased electricity and bedding materials and benefit from government incentives. The economic viability of AD is highly constrained and dependent on the unpredictability of incentives and electricity price. Under the above circumstances, additional revenues generated through sale of anaerobically digested fiber residue can have an outsized impact on overall project economics. For example, a 500-head cattle farm stands to make a potential $15,000 - $20,000/yr after meeting its own bedding needs at a sales price of $8/cu. yd. for fiber. This economic value is of similar magnitude to the value of electricity produced from manure only. It enhances revenues for individual farmers and improves the sustainability of livestock farming in general and dairy farming in particular.

Impacts of Anaerobic Digestate Replacing Peat

One of the emerging higher value uses for anaerobically digested fiber is as peat replacement in the horticulture industry. Currently 100% of peat moss is imported from Canada, providing room for significant use of AD fiber in this market. Dairy digester fiber also provides an environmental advantage in comparison to peat moss across all environmental indicators such as global warming potential, eco-toxicity, and health effects. IL, MI, and OH are home to a significant horticulture industry, while states such as WI, MI, and MN have large dairy farm operations. The linking of these sectors could benefit both individual farmers/growers as well the overall sectors.

Experimental Results

A fourteen-day trial to determine the suitability of these fibers for lettuce production was undertaken. The trial consisted of a controlled experiment using a standard germination mix and digestate fiber (DM) as substitute for peat moss control (v/v) with a sample size of n=3/treatment. Seeds germinated more quickly and uniformly, and in greater abundance, with an increasing blend of DM mix up to about 25% as compared to the peat moss control. Additional experiments are underway to improve the properties of AD fiber for use in horticulture by lowering the nitrogen content. Partnerships with dairy farmers, horticulture growers, and suppliers of fertilizers are being formed to fully exploit this opportunity and to facilitate the development of a stable and broad market.